Comparative analysis of the immune response induced by native and recombinant versions of the ASP-based vaccine against *Cooperia oncophora* in calves.

Ana González-Hernández[1], Stijn Casaert[1], Jimmy Borloo[1], Iris Peelaers[1], Edwin Claerebout[1], Peter Geldhof[1]

[1]Laboratory of Parasitology, Faculty of Veterinary Medicine, Ghent University
Salisburylaan 133, 9820 Merelbeke, Belgium

The aim of our study was to unravel the mechanisms underlying the vaccine-induced immune responses by native and recombinant ASP-based vaccines against the gastrointestinal parasite *Cooperia oncophora*. Cattle were immunized with the protective native vaccine and the antigen-specific humoral and cellular responses compared with the responses induced by a non-protective recombinantly produced version of the vaccine.
We observed that *in-vitro* re-stimulation of lymphocytes from calves vaccinated with the native *C. oncophora* vaccine resulted in a marked proliferation of CD4-T cells and NK cells systemically, and γδ-T cells, CD4-T cells and NK cells in the local draining lymph nodes of the small intestine. Although the recombinant vaccine induced a similar type of response, the magnitude of the cellular proliferation, both systemically and mucosally, was significantly lower compared to the native vaccine. In terms of humoral responses, vaccination with both native and recombinant vaccines resulted in an increase of ASP-specific IgG1 and IgG2 levels in serum and mucosa when compared to control animals. However, inhibition ELISAs showed that the antibodies induced by the native vaccine markedly differed in their binding specificity compared to the antibodies raised against the non-protective recombinant vaccine.
In summary, the outcome of this research shows that a protective response following vaccination is associated with a strong cellular response, in particular CD4-T cells, and the induction of antigen-specific IgG1 and IgG2-type antibodies. Whether the differences in the immune responses induced are caused by variations in the conformational state of the native and recombinant version of the ASP antigen is currently being further investigated.